

Amendment
US Appl. No. 10/595,220
Attorney Docket No. PSA0311447

AMENDMENTS TO THE DRAWINGS

Please replace the sole sheet of drawings by the replacement sheet which is submitted with this paper. The replacement sheet is identical to the original sheet of drawings except that previously stippled and shaded areas are shown in white.

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REMARKS

By the present amendment, claim 1 has been amended to recite that, during the time intervals of controlling the closing of the valve(s) corresponding to the intake pipe(s) supplied with fuel when the injection system does not operate, the method comprises controlling the opening of the intake valve(s) corresponding to the intake pipe(s) not supplied with fuel, so as to supply the cylinder with air.

Further, claim 2 has been amended to recite that the central unit makes it possible to control the actuating devices so as to, during the time intervals of closing the valve(s) corresponding to the intake pipe(s) equipped with a fuel injection device when the means for controlling the fuel injection device cut operation of the latter, open the intake valve(s) corresponding to the intake pipe(s) not supplied with fuel, in order to supply the cylinder with air.

Also, in claims 1 and 2, “characterized in that” has been replaced by “wherein,” and reference numerals and letters have been deleted.

New claims 3 and 4 have been added.

Support for the added recitations is found in the original application, for example, on page 5, lines 3-13.

A replacement sheet of drawings is submitted with this paper. The replacement sheet does not add any new matter.

Claims 1-4 are pending in the present application. Claims 1 and 2 are the only independent claims.

Amendment
US Appl. No. 10/595,220
Attorney Docket No. PSA0311447

In the Office Action, the drawings are objected to under 37 C.F.R. 1.84(m) as including black shaded areas.

A replacement sheet is submitted with this paper. The replacement sheet is identical to the original sheet of drawings except that previously stippled and shaded areas are shown in white.

In view of the above, it is submitted that the objection should be withdrawn.

Next, in the Office Action, claims 1 and 2 are rejected under 35 U.S.C. 103(a) as obvious over US 4,938,191 to Oldani et al. ("Oldani") in view of US 5,803,040 to Biesinger et al. ("Biesinger").

It is alleged in the Office Action that Oldani discloses a plurality of intake valves for each cylinder and Biesinger discloses closing the intakes valves of a deactivated cylinder.

Reconsideration and withdrawal of the rejection is respectfully requested. Oldani discloses a multi-cylinder engine equipped with at least two induction valves per cylinder, each valve terminating an induction duct. The injector is located in a position such that the fuel is mostly injected towards one of said induction duct (see reference numeral 18 in Fig. 1 of Oldani). Oldani further teaches a stroke according to which the other valve is first opened to start filling the compression chamber with a weakly carburated air, and then the second valve is opened, to let the richly carburated air entering the chamber and mixing with the weakly carburated air in such a way that the combustion is said to be improved.

However, Oldani is totally silent as to phases where the injection is stopped (deceleration periods for instance), and Oldani is also totally silent regarding letting cold air into the

Amendment
US Appl. No. 10/595,220
Attorney Docket No. PSA0311447

combustion chamber when no fuel is injected, and leaving the chamber to the exhaust pipe to contribute to cooling a catalytic converter.

Further, the main objective of Biesinger is to prevent cooling of the deactivated cylinders where no injection is temporally made. Specifically, in the passage of Biesinger to which the Office Action, Biesinger discloses closing all intake valves simultaneously and states explicitly that “there is neither any fuel injection into a cylinder that has been shut down nor are there operating cycles in which only air is conducted into the combustion chamber” (Biesinger at col. 7, lines 43-46). Therefore, Biesinger fails to remedy the deficiencies of Oldani, so that a person of ordinary skill in the art would not have been motivated to combine the two references.

In addition, even if, arguendo, a person of the art had attempted to combine these references (which is denied), since Biesinger concerns an engine equipped with only one intake and one exhaust valve per cylinder, that person would have found no guidance on how to manage the valve closing, except by closing both intake valves when a cylinder is deactivated to make sure fresh air does not enter the combustion chamber, as taught in Biesinger. As a result, any attempt at such improbable combination of references would not have led to a suggestion of letting air in when no fuel is burned.

In contrast, in the presently claimed invention, the method comprises controlling the closing of the valve(s) corresponding to the intake pipe(s) supplied with fuel during the time intervals when the injection system does not operate, and during these time intervals, controlling the opening of the intake valve(s) corresponding to the intake pipe(s) not supplied with fuel, so as to supply the cylinder with air, as recited in present claim 1.

Amendment
US Appl. No. 10/595,220
Attorney Docket No. PSA0311447

Further, in the presently claimed invention, the central unit of the system makes it possible to control the actuating devices so as to close the valve(s) corresponding to the intake pipe(s) equipped with a fuel injection device during the time intervals when the means for controlling the fuel injection device cut operation of the latter, and during these time intervals, open the intake valve(s) corresponding to the intake pipe(s) not supplied with fuel, in order to supply the cylinder with air, as recited in present claim 2.

An advantage of the presently claimed invention is that by letting in air even though the injection is stopped, it is possible to introduce cold air into the combustion chamber in the absence of fuel burning, so that the air can leave the chamber to the exhaust pipe where it can contribute to cool the catalytic converter, as described for example on page 5, lines 11-12.

The features of the presently claimed invention and their advantages are not taught in any of the cited references. Therefore, the present claims are not obvious over the cited references taken alone or in any combination.

In addition, with respect to dependent claims 3-4, it is submitted that Biesinger teaches away from preserving air flow at the exit of the engine. Therefore, present claims 3-4 are not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

Amendment
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In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

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